AMENDMENTS TO THE CLAIMS:

Please amend claims 1 and 13 and add newly written claims 38-42 as follows.

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (currently amended) A pulse width modulation switching circuit, responsive to a voltage demand signal, for controlling current supplied to an inductor from a direct current (DC) supply voltage, said switching circuit comprising:

a bridge circuit, said bridge circuit comprising:

an input operable to receive a direct current, DC, supply of nominal voltage $+V_S$,

an output connected to said inductor, said output having opposed ends; and

first and second bridge arms, said arms having corresponding first and second switches operable in response to first and second switching signals to be switched between on and off states, wherein switching between various combinations of on and off states produces an electrical signal at the opposed ends of said output with voltage pulses at levels of nominally $+V_S$, 0V, and $-V_S$;

a voltage sensor for producing a signal indicative of said DC supply voltage; and

a switching signal generator, responsive to said DC supply voltage signal and said voltage demand signal, for generating said first and second switching signals.

2. (cancelled).

3. (cancelled).

4. (cancelled).

5. (cancelled).

6. (previously presented) A switching circuit according to claim 1, further comprising a current sensor for producing a signal indicative of the current flowing through the output.

7. (cancelled).

8. (cancelled).

9. (previously presented) A switching circuit according to claim 1, wherein the bridge circuit is a half-bridge with the third and fourth arms having diodes.

10. (previously presented) A switching circuit according to claim 1, wherein the first and second switches are transistors.

11. (previously presented) A switching circuit according to claim 1, wherein said inductor comprises an electromagnet connected across the output of the bridge circuit.

12. (cancelled).

13. (currently amended) A method of pulse width modulation control of a bridge ~~operating a switching~~ circuit comprising an input that receives a DC supply of nominal voltage $+V_S$, an output having an electromagnet connected thereacross, and having first and second

switches, respectively, wherein first and second arms of said bridge circuit are connected to opposing ends of the electromagnet, the method comprising the steps of:

(a) receiving a voltage demand signal indicative of a desired voltage of an electrical signal to be supplied to the ~~output~~electromagnet in a pulse width modulation period;

(b) generating first and second switching signals with reference to the voltage demand signal and with reference to an indication of the DC supply voltage; and

(c) applying the first and second switching signals to the first and second switches, respectively, during ~~the~~said period;

wherein the switching signals cause the switches to switch between on and off states, switching between various combinations of on and off states of the first and second switches producing within the period an electrical signal across the electromagnet~~at the output~~ with voltage pulses at levels ~~of nominally~~selected from any of $+V_S$, 0V and $-V_S$, the first and second switching signals being generated such that an average voltage of the electrical signal supplied to the electromagnet~~output~~ during the period is substantially equal to the desired voltage.

14. (previously presented) The method of claim 13, wherein at least one of the first and second switching signals is generated with reference to a voltage signal indicative of the DC supply such that the at least one first or second switching signal compensates for fluctuations in the DC supply.

15. (original) The method of claim 14, wherein the voltage signal is passed through a filter to obtain a predictive measure of fluctuations in the DC supply.

16. (original) The method of claim 15, wherein the voltage signal is passed through a finite impulse response filter.

17. (previously presented) The method of claim 13, wherein at least one of the first and second switching signals is generated to compensate for a voltage drop across a diode and/or transistor in the switching circuit.

18. (original) The method of claim 17, wherein the at least one first or second switching signal is generated with reference to a current signal indicative of the current flowing through the output and a representative resistance of the diode or transistor.

19. (previously presented) The method of claim 13, wherein at least one of the first or second switching signals is generated with reference to a measure of a voltage offset caused by a slow response in generating the first or second switching signals.

20. (previously presented) The method of claim 13, wherein the switching circuit comprises a bridge circuit having an input that receives the DC supply, an output and first and second arms having first and second switches respectively, the first and second arms being connected to opposed ends of the output.

21. (original) The method of claim 20, wherein the bridge circuit is a half-bridge with the third and fourth arms having diodes.

22. (previously presented) The method of claim 20, wherein the first and second switches are transistors and the method comprises the step of switching the transistors between on and off states corresponding to substantially minimum voltage drop and substantially minimum current flow, respectively, through the transistors.

23. (previously presented) The method of claim 13 comprising the step of generating pulsed first and second switching signals.

24. (original) The method of claim 23 comprising the step of generating the first and second switching signals according to a rule that the first and second switches are not switched concurrently.

25. (previously presented) The method of claim 23 comprising the step of generating the first and second switching signals according to a rule that the signals are to have no more than one pulse per period.

26. (original) The method of claim 25 comprising the step of generating the first and second switching signals according to a rule that any pulse should be positioned symmetrically about the centre of the period.

27. (previously presented) A method of operating a switching circuit comprising an input that receives a DC supply of nominal voltage $+V_S$, an output and first and second switches, the method comprising the steps of:

(a) receiving a voltage demand signal indicative of a desired voltage of an electrical signal to be supplied to the output in a period;

(b) generating first and second switching signals with reference to the voltage demand signal and with reference to an indication of the DC supply voltage; and

(c) applying the first and second switching signals to the first and second switches respectively during the period;

wherein the switching signals cause the switches to switch between on and off states, switching between various combinations of on and off states of the first and second switches producing an electrical signal at the output with voltage pulses at levels of nominally $+V_S$, 0V and $-V_S$, the first and second switching signals being generated such that an average voltage of the electrical signal supplied to the output during the period is substantially equal to the desired voltage, wherein the step of generating first and second switching signals comprises generating pulsed first and second switching signals, generating said pulsed first and second switching signals according to a rule that the signals are to have no more than one pulse per period and generating the first and second switching signals according to the rule that where pulses cannot be centred symmetrically, the longer and shorter sides of the asymmetric pulses are alternated between the leading edge side and the trailing edge side for successive pulses.

28. (previously presented) The method of claim 23 comprising the step of generating the first and second switching signals according to a pulse width modulation scheme.

29. (previously presented) The method of claim 23 comprising the step of noise shaping the first and second switching signals.

30. (previously presented) The method of claim 13 comprising the step of receiving a current demand signal indicative of a desired current to be supplied to the output in a period and calculating the voltage demand signal indicative of a desired voltage of an electrical signal to be supplied to the output that results in the electrical signal being supplied to the output during the period with a current substantially equal to the desired current.

31. (original) The method of claim 30, wherein the step of calculating the voltage demand signal is performed with reference to a model of the load characteristic of a load connected to the output.

32. (previously presented) The method of claim 30 further comprising the step of generating the voltage demand signal with reference to a current signal indicative of the current flowing through the output.

33. (previously presented) A computer program comprising program code means for performing the method steps of claim 13 when the program is run on a computer associated with the switching circuit.

34. (previously presented) A computer program product comprising program code means stored on a computer readable medium for performing the method steps of claim 13 when the program is run on a computer associated with the switching circuit.

35. (canceled)

36. (canceled)

37. (canceled)

38. (new) The method of claim 13, wherein, when the desired voltage is of less than a predetermined magnitude, the first and second switching signals are generated such that the electrical signal comprises voltage pulses of both V_S and $-V_S$ within the period.

39. (new) The method of claim 13, wherein, when the desired voltage is of at least predetermined magnitude, the first and second switching signals are generated such that the electrical signal comprises voltage pulses of either V_S or $-V_S$ within the period.

40. (new) A pulse width modulation controller for an electromagnet comprising:

a supply input for providing a DC supply of nominal voltage V_S;

a bridge circuit comprising first and second arms having first and second switches respectively, the first and second arms being connected to opposed ends of the electromagnet;

a voltage demand signal indicative of a desired voltage to be supplied to the electromagnet in a pulse width modulation period;

a switching signal generator configured to generate first and second switching signals with reference to the voltage demand signal and to apply the first and second switching signals to the first and second switches, respectively, during said pulse width modulation period;

wherein said first and second switching signals cause the switches to switch between on and off states and producing within the pulse width modulation period an electrical signal across the electromagnet with voltage pulses at levels selected from any of V_S, 0V and $-V_S$.

41. (new) The controller of claim 40 wherein the switching signal generator is configured, when the desired voltage is of less than a predetermined magnitude, to generate the first and second switching signals to provide the electrical signal comprising voltage pulses of both V_S and $-V_S$ within the period.

42. (new) The controller of claim 40 wherein the switching signal generator is configured, when the desired voltage is of at least a predetermined magnitude, to generate the first and second switching signals to provide the electrical signal comprising voltage pulses of either V_S or $-V_S$ within the period.